Spherical Space Forms: Homotopy Types and Self-Equivalences for the Group $(\mathbb{Z}/a \rtimes \mathbb{Z}/b) \times SL_2(\mathbb{F}_p)$

Marek Golasiński and Daciberg Lima Gonçalves

Abstract. Let $G = (\mathbb{Z}/a \rtimes \mathbb{Z}/b) \times SL_2(\mathbb{F}_p)$, and let $X(n)$ be an n-dimensional CW-complex of the homotopy type of an n-sphere. We study the automorphism group $\mathrm{Aut}(G)$ in order to compute the number of distinct homotopy types of spherical space forms with respect to free and cellular G-actions on all CW-complexes $X(2dn - 1)$, where $2d$ is the period of G. The groups $\mathcal{E}(X(2dn - 1)/\mu)$ of self homotopy equivalences of space forms $X(2dn - 1)/\mu$ associated with free and cellular G-actions μ on $X(2dn - 1)$ are determined as well.